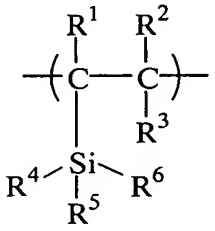
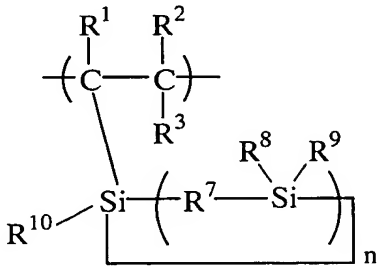
CLAIMS:

1. A silicon-containing polymer comprising recurring units of at least one of the following general formulae (1) and (2):



(1)

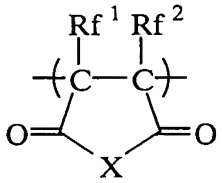
wherein R^1, R^2 and R^3 each are hydrogen or a straight, branched or cyclic alkyl group of 1 to 10 carbon atoms, R^4, R^5 and R^6 each are independently an alkyl or haloalkyl group having 1 to 20 carbon atoms, an aryl group having 6 to 20 carbon atoms or a silicon-containing group attached to the silicon atom through a siloxane or silalkylene linkage,



(2)

wherein R^1 to R^3 are as defined above, R^7 is an oxygen atom, a straight, branched or cyclic alkylene group of 1 to 10 carbon atoms or an arylene group, R^8 to R^{10} each are independently a straight, branched or cyclic alkyl or fluorinated alkyl group having 1 to 10 carbon atoms or an aryl group, and n is an integer of 2 to 10.

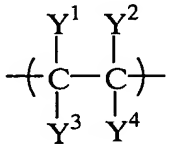
2. The silicon-containing polymer of claim 1 further comprising recurring units of the general formula (3):



(3)

wherein X is an oxygen atom, a sulfur atom or -NR-, R is hydrogen, hydroxyl, a straight, branched or cyclic alkyl group of 1 to 10 carbon atoms, or an aryl group, and may contain an acid labile group, Rf^1 and Rf^2 each are independently hydrogen, fluorine or trifluoromethyl.

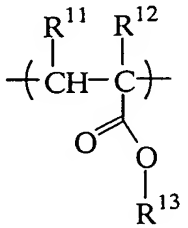
3. The silicon-containing polymer of claim 1 further comprising recurring units of the general formula (4):



(4)

wherein Y^1, Y^2, Y^3 and Y^4 are independently selected from the class consisting of hydrogen, fluorine, chlorine, bromine, cyano, alkoxycarbonyl, fluorinated alkyl and fluorinated alkoxycarbonyl groups.

4. The silicon-containing polymer of claim 1 further comprising recurring units of the general formula (5):



(5)

wherein R^{11} and R^{12} each are hydrogen or a straight, branched or cyclic alkyl group of 1 to 10 carbon atoms, and R^{13} is an acid labile group or adhesive group.

5. A resist composition comprising the polymer of claim 1.

6. A chemically amplified, positive resist composition comprising

(A) the polymer of claim 1,

(B) a photoacid generator, and

(C) an organic solvent.

7. The resist composition of claim 6 further comprising (D) a dissolution inhibitor.

8. The resist composition of claim 6 further comprising (E) a basic compound.

9. A process for forming a resist pattern comprising the steps of:

applying the resist composition of any one of claims 5 to 8 onto a substrate to form a resist layer,

heat treating the resist layer and then exposing it to high-energy radiation having a wavelength of up to 300 nm or electron beam through a photo mask, and

optionally heat treating the exposed resist layer and developing it with a developer.

10. A process for forming a resist pattern comprising the steps of:

applying the resist composition of any one of claims 5 to 8 onto a processable substrate formed on a support substrate through an organic film to form a resist layer,

heat treating the resist layer and then exposing it to high-energy radiation having a wavelength of up to 300 nm or electron beam through a photo mask,

optionally heat treating the exposed resist layer and developing it with a developer, and

treating the organic film and the processable substrate by an etching process including oxygen plasma etching at the portions where the exposed resist layer portions are removed by developing.

11. The process of claim 10 wherein the organic film is a novolac resin or polyhydroxystyrene layer.

12. A process for forming a resist pattern comprising the steps of:

applying the resist composition of any one of claims 5 to 8 onto a processable substrate formed on a support substrate to form a resist layer,

heat treating the resist layer and then exposing it to high-energy radiation having a wavelength of up to 300 nm or electron beam through a photo mask,

optionally heat treating the exposed resist layer and developing it with a developer, and

treating the processable substrate by an etching with a halogen gas containing chlorine or bromine at the portions where the exposed resist layer portions are removed by developing.